A NEW SPECIES OF *PTILIMNIUM* (APIACEAE) FROM THE ATLANTIC COAST

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ABSTRACT

Ptilimnium ahlesii Weakley & Nesom, sp. nov., is described from localities in eight counties of North Carolina, South Carolina, and Georgia in tidal freshwater marshes within 20 miles of the Atlantic coast. The species has been previously identified as *P. capillaceum* but differs from the latter in its conspicuously large ovaries and fruits, which at maturity are 2.7–4.2 mm long and 1.8–2.2 mm wide (vs 1.4–2.5 mm long and 0.8–1.2 mm wide in *P. capillaceum*), in its less-divided leaves, and in its inflorescences with fewer umbellets per umbel and fewer flowers per umbellet. The new species also flowers and fruits earlier than *P. capillaceum* (May–early June, late May–July, vs. mid June–early August, July–September, respectively). *Ptilimnium ahlesii* is rare and restricted to freshwater or slightly brackish marshes, while *P. capillaceum* has a wider geographic range and ecological tolerance, but the two species grow in close proximity in their area of sympatry.

RESUMEN

Se describe **Ptilimnium ahlesii** Weakley & Nesom, sp. nov., de varias localidades en ocho condados de Carolina del norte, Carolina del Sur y Georgia en bordes de charcas de agua dulce en una banda de 20 millas en la costa atlántica. La especie ha sido previamente identificada como *P. capillaceum* pero difiere de ésta por los ovarios y frutos claramente más grandes, que en la madurez tienen 2.7–4.2 mm de longitud y 1.8–2.2 mm de anchura (contra 1.4–2.5 mm de longitud y 0.8–1.2 mm de anchura en *P. capillaceum*), por sus hojas menos divididas, y por sus inflorescencias con menos umbélulas por umbela y menos flores por umbélula. La nueva especie también florece antes que *P. capillaceum* (principios de mayo–junio, finales de mayo–julio, vs. mediados de junio–principios de agosto, julio–septiembre, respectivamente). *Ptilimnium ahlesii* es rara y restringida a charcas de agua dulce o ligeramente salobres, mientras que *P. capillaceum* tiene un rango geográfico y tolerancia ecológica más amplia, pero las dos especies crecen muy próximas en su área de simpatría.

An exceptionally large-fruited form of *Ptilimnium* has been observed and collected in coastal counties of North Carolina, South Carolina, and Georgia (Figs. 1, 2, and 3). This plant apparently drew the attention of the late Harry E. Ahles, then working at the University of North Carolina Herbarium (NCU), and specimens at NCU include annotations in his hand indicating his opinion that they represented an undescribed species to be named "*P. macrospermum*." In the Carolinas "Guide" (Radford et al. 1964), these plants were included in the key and species summaries as "*Ptilimnium macrospermum* Ahles." The following year, it was mapped in the Carolinas "Atlas" in Brunswick, New Hanover, and Pender

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counties, North Carolina, and Georgetown and Jasper counties, South Carolina (Radford et al. 1965). Three years later, in the first printing of the Carolinas "Manual," this entity was placed as a synonym of *P. capillaceum* (Michx.) Raf. with the notation that the name was "a nomen nudum" attributed to Ahles, but was confusingly included in the key as "*P. macrospermum*" (Bell 1968, in Radford et al.); in later printings it was also removed from the key, presumably confirming the intent of Bell not to include the taxon. Bell (pers. comm., June 2004) states that he was uncertain of the taxonomic distinctiveness of the taxon, because of the paucity of herbarium material available, and as it had not been validly published he decided not to include it in the "Manual" (see Sorrie 1997 for examples of other unpublished names by Ahles).

The name in similar form has resurfaced in a widely used database (Kartesz 1999), as "*Ptilimnium macrospermum* Kartesz, sp. nov. ined." Additionally, the taxon has been considered to be of conservation concern by the network of Natural Heritage Programs and has been tracked as a rare species under the unofficial name "*Ptilimnium sp. 1*" in North Carolina and Georgia (Franklin 2004, Georgia Natural Heritage Program 2004). The potential conservation importance of the putative taxon demands that this taxonomic and nomenclatural confusion be resolved, and the species has been the subject of field and herbarium study by the authors since 1990. With these additional observations, we conclude that this plant is a distinctive and undescribed species. We are pleased to provide it with a valid name, allowing it to proceed in polite company, rather than under a twice-naked name ("*Ptilimnium macrospermum*"), a non-name ("*Ptilimnium sp. 1*"), or inappropriately ignored under *Ptilimnium capillaceum* (Michx.) Raf. The new epithet validated here honors the original insight of Harry E. Ahles regarding this, as well as his general contributions to the understanding of the flora of the Carolinas through his voracious collecting.

Ptilimnium ahlesii Weakley & Nesom, sp. nov. (**Figs. 1–3**). TYPE: NORTH CAROLINA. Brunswick Co.: tidal freshwater marsh of the Brunswick River, just E of the Brunswick River and just N of the US 74-76 causeway, ca. 2 mi W of Wilmington, growing with *Typha angustifolia, Carex hyalinolepis, Pontederia cordata, Pentandra virginica, Sagittaria lancifolia, Rumex verticillatus,* and *Taxodium distichum*, 34° 14' 04.7"N, 77° 59'05.7" (NAD 83), *Alan S. Weakley 7317 and Richard J. LeBlond*, 10 Jun 2004 (HOLOTYPE: NCU; ISOTYPES: BRIT, CLEMS, GH, MO, NY, TEX, UGA, US, USCH.

Ptilimnio capillaceo (Michx.) Raf. similis bracteis involucralibus divisis, ramis brevibus styli, et costis lateralibus fructus valde evolutis, sed differt foliis divisionibus 2–3 (versus 3) per nodum, umbellulis 5–8(–13) per umbellam, floribus 5–8 per umbellulam, fructibus majoribus (2.7–4.2 mm longis versus 1.4–2.5 mm), geographica ac habitatione multo magis restrictis, et tempore praecoci florendi ac fructificandi.

Annual, glabrous, caulescent herbs from a short system of fibrous roots, the stems erect, 4–13 dm tall, unbranched or in vigorous individuals branching above mid-stem. Lower stem leaves (often withered by anthesis) phyllodial (re-

FIG. 1. Holotype of *Ptilimnium ahlesii*. Note the nearly phyllodial lower stem leaves, the broadened segments of the mid-cauline leaves, and the large fruits (not fully mature).

Fig. 2. Inflorescence of *Ptilmnium ahlesii* (from an isotype). Note the large fruits, the divided involucral bracts, and the few umbellets/umbel and few flowers/umbellet (as compared to *P. capillaceum*)

duced to the hollow rachis and lacking lateral segments, thus closely resembling the quill-leaves of *P. fluviatile*, *P. nodosum*, and *P. viviparum*) to simply pinnate, the segments (when present) flattened, to 2 mm wide; mid- and upper-stem leaves pinnately decompound, 3–21 cm long, the segments filiform to distinctly flattened, with 2–3 divisions at primary nodes on the rachis; petioles 3–25 mm long, broadly winged, ca 5-ribbed. Inflorescence umbellate, distinctly and irregularly flat-topped (the rays variable in length), once-compound, the umbels terminal and axillary on the upper half of the stem, peduncles 5–14 cm

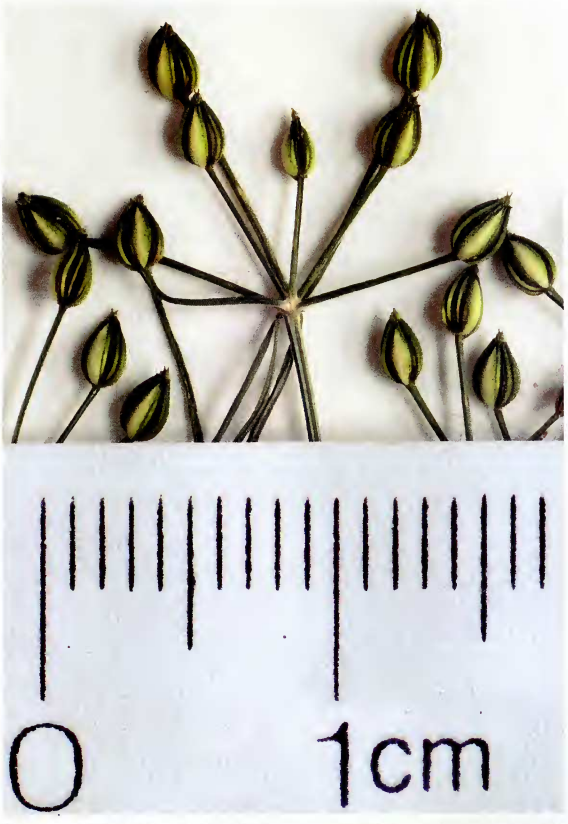

Fig. 3. Fruits (nearly but not fully mature) of *Ptilimnium ahlesii*, from an isotype.

long; primary rays 5–13, 5–35 mm long, pedicels (2–)4–10, (3–)5–10 mm long; involucre of linear bracts, entire or 3-parted; involucel of linear bracts. Calyx teeth deltoid, acute to subacuminate, persistent; petals white, obovate, 0.6–0.8 mm long; stylopodium conic, the styles mostly slightly shorter than the stylopodium, ascending to erect-ascending or widely spreading; anthers light purplish. Carpophore bifid at the apex. Fruit elliptic-ovoid, slightly compressed laterally, 2.7–3.5 mm long, 1.8–2.2 mm wide, the mericarps loosely connate and usually separated at maturity; dorsal ribs 3, narrow and sharp-edged, the lateral ribs similar but with a broad, rounded, corky-thickened extension, the extensions of the adjacent mericarps connate and forming a broad, conspicuous band around the fruit; oil tubes dark rusty-brown. In tidal freshwater marshes; flowering May to early June, fruiting late May to July.

Collections examined. **UNITED STATES. GEORGIA. Chatham Co.:** Savannah National Wildlife Refuge, along Hwy 17, fresh-water marsh, 14 Jul 1966, *Bozeman 6100* (NCU, distributed as "*Ptilimnium macrospermum* Ahles"). **NORTH CAROLINA. Brunswick Co.:** Wilmington, Jun 1898, *Ashe s.n.* (NCU). **New Hanover Co.:** 1 mi N of US 17 on Wrightsboro Road, marsh, 2 Jun 1949, *Radford 4353* (NCU); brackish marsh on the Cape Fear River on US 17, 29 Jun 1963, *Ahles 58397* (NCU) **Pender Co.:** swamp on Northeast Cape Fear River near Rocky Point—Hampstead Road, 1 Jun 1950, *Radford 5142* (NCU). **SOUTH CAROLINA. Beaufort Co.:** 0.5 mi W of Co. Road 111 on Co. Road 33, cat-tail swamp near Trichinham Plantation, 27 Jun 1956, *Bell 3767* (NCU). **Berkeley Co.:** Cooper River at the mouth of Durham Creek, low salinity, 7 Jun 1990, *McAninch 23* (NCU). **Colleton Co.:** 1.4 mi NE of Ashepoo on US Hwy 17, swamp, 26 Jun 1956, *Bell 3703* (NCU). **Georgetown Co.:** tidal marsh of Baruch Plantation, 20 Jun 1967, *Barry 103* (USCH); Baruch Plantation, fresh-water marsh affected by tidal action, 17 Jun 1969, *Batson s.n.* (USCH); Baruch Plantation, slough in freshwater marsh, 27 Jun 1969, *Batson s.n.* (USCH); occasional in sunny spots in wet swampy woods, W side of South Island Road (S-18) about 4 mi W of Intracoastal Waterway, 16 May 1990, *Nelson 9024* (USCH); Sampit River near US 17A, 9.5 mi W of Georgetown, fresh-water marsh, 13 Jun 1957, *Radford 25139* (NCU).

Relationships within the genus

Ptilimnium is a relatively small genus centered in the southeastern and south-central United States. The five to seven species are separable into subgroups on the basis of differences in morphology and chromosome number, although apparent dysploid differences in chromosome number suggest that the situation may be more complex than the current assessment allows. Plants with leaves reduced to a winged petiole and extended rachis (with lateral segments suppressed, the structures sometimes referred to as "phyllodia") are diploids based on $x = 6$ ($2n = 12$; Easterly 1957; Bell & Constance 1960). These plants have been regarded as comprising from one to three species, *P. nodosum* (Rose) Mathias, *P. viviparum* (Rose) Mathias, and *P. fluviatile* (Rose) Mathias) (Kral 1981; Kress et al. 1994; Bartgis 1997); the appropriate taxonomic disposition remains unclear and is under additional study. *Ptilimnium costatum* (Ell.) Raf. has distinctly petiolate leaves with short, crowded, verticillate segments, long styles, and a tetraploid chromosome complement based on $x = 8$ ($2n = 32$; Easterly 1957). One population of *P. costatum* from Illinois has been counted as $2n = 22$ (Bell & Constance 1960), this perhaps a tetraploid ($x = 6$, $2n = 24$) having lost one pair of chromosomes.

Ptilimnium ahlesii, *P. capillaceum*, and *P. nuttallii* are similar in their relatively short styles (shorter than or equalling the stylopodia) and primarily diploid chromosome number based on $x = 7$ ($2n = 14$; Easterly 1957, Bell and Constance 1960). Tetraploid plants ($2n = 28$) of *P. capillaceum* were reported by Easterly (1957) from central Georgia (Unadilla County). These were found apparently intermixed with diploid plants of the same species and with plants of *P. nodosum* "nearby in the same ditch." Easterly did not comment on any morphological difference between the conspecific diploids and tetraploids. One population of *P. capillaceum* from Florida has been counted as $2n = 16$ (Constance et al. 1976). It is notable that the basal and lower stem leaves of *P. ahlesii*, produced in the spring and typically withering prior to flowering and fruiting, have few to no leaflets, and therefore closely resemble the reduced "quill leaves" of the "Harperella" group of *Ptilimnium* (*P. fluviatile*, *P. nodosum*, and *P. viviparum*). This supports the broader circumscription of *Ptilimnium* as including *Harperella* Rose that has been generally followed in recent decades.

Ptilimnium texense Coulter & Rose was originally described as a species (Coulter & Rose 1909) but later (Mathias & Constance 1944–45; Easterly 1957) interpreted to be of hybrid origin and of intermediate morphology between *P. capillaceum* and *P. nuttallii*. This interpretation has been accepted and repeated by subsequent workers (e.g., Correll & Johnston 1970; Correll & Correll 1972), although Mathias & Constance (1961) placed it in synonymy, without comment, under *P. costatum*. Study of *Ptilimnium* collections at LL,TEX shows only a single entity in Texas (interpreted here as *P. costatum*) other than *P. capillaceum* and *P. nuttallii*.

In the freshwater tidal marshes west of Wilmington, North Carolina, three species of *Ptilimnium* grow in close proximity to one another: *Ptilimnium ahlesii*, *P. capillaceum*, and *P. costatum*. They are morphologically distinctive; no intermediates have been seen. Observations over the past decade further suggest that the flowering times of the three species are largely or completely non-overlapping, with *P. ahlesii* flowering first (May to early June), followed by *P. capillaceum* (mid-June to early August), and then *P. costatum* (late July to August). The phenologic separation provides additional evidence corroborating the status of *P. ahlesii* as a distinct taxon and not merely a large-fruited form of *P. capillaceum*.

Of its closest relatives, *Ptilimnium ahlesii* is most similar to *P. capillaceum*, particularly in its divided involucral bracts, minute calyx teeth, dorsal fruit ribs narrower than the intervals, and lateral ribs with expanded, corky margins encircling the fruit like a band (*P. costatum* also shares the distinctive fruit morphology). The two species are separated by the following contrasts (and see Figs. 1 and 2).

1. Mature fruit elliptic-ovate, 2.7–4.2 mm long, 1.8–2.2 mm wide; umbels flat-topped, irregular, the rays variable in length; umbellets 5–8(–13) per umbel, the rays 5–35

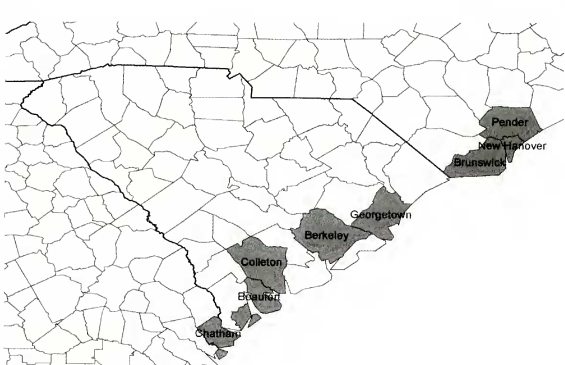

Fig. 4. Map of documented county distribution (in, from north to south, North Carolina, South Carolina, and Georgia) of *Ptilimnium ahlesii*.

mm long; flowers 5–8 per umbellet; petals 0.6–0.8 mm long; leaf segments of mid-stem leaves 15–30(–40), capillary to linear, 0.5–2.0 mm wide; flowering May-early June, fruiting late May-July; tidal freshwater marshes, rare in North Carolina, South Carolina, and Georgia _____ **Ptilimnium ahlesii**

1. Mature fruit ovate to orbicular, 1.4–2.5 mm long, 0.8–1.2 mm wide; umbels generally rounded to hemispheric, the rays generally nearly equal in length; umbellets (5–)9–21 per umbel, the rays 5–21 mm long; flowers usually 10 or more per umbellet; petals 0.3–0.6 mm long; leaf segments of mid-stem leaves 50 or more, capillary, usually less than 0.5 mm wide (except in submersed leaves); flowering June-August, fruiting July-September; ditches, marshes, other wet places; common and widespread in eastern North America, ranging from Massachussetts and New York to Missouri and Kansas, south to Florida and Texas _____ **Ptilimnium capillaceum**

Descriptions by various authors (e.g., Fernald 1950; Mathias and Constance 1944–45; Easterly 1957) of *P. capillaceum* with fruit longer than 3 mm almost certainly included observations of *P. ahlesii*. Annotations by both Constance and Easterly of NCU collections of *P. ahlesii* as *P. capillaceum* appear to confirm this. Associated with the smaller number of umbellets and flowers borne by *P. ahlesii*, as noted in the key, plants produce about 45–70 flowers/fruits per inflorescence, compared to those of *P. capillaceum*, which usually produce over 100. Depauperate plants of *P. capillaceum*, however, can have reduced inflorescences.

It appears that this species is narrowly distributed ecologically and geographically, to tidal marshes associated with the tidal reaches of rivers in southeastern North Carolina, South Carolina, and eastern Georgia (Fig. 4).

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